YCA360M SINGLE AXIS PHOTOVOLTAIC TILT SENSOR

PRODUCT DESCRIPTION

YCA 360 single-axis series inclination sensor is a new low-cost Solar tracking tilt angle measurement product independently developed by DPF. Adopting the latest anti-interference platform design, integrating new micro-mechanical sensing unit , wide temperatureworking performance, excellent anti-vibration performance, stable and reliable long-term work, and effective working life of up to 10 years. This product uses a non-contact principle to measure the tilt angle of an object, and calculates the real-time tilt angle by measuring the component produced by the earth's gravity through an internal capacitive micromechanical unit.The installation is simple and convenient, and it only needs to be fifixed on the object to be tested, and does not need to fifix the shaft and the rotating shaft.A variety of installation methods to meet customer measurement needs. It is an ideal accessory for engineering machinery, agricultural machinery, and other industrial equipment.

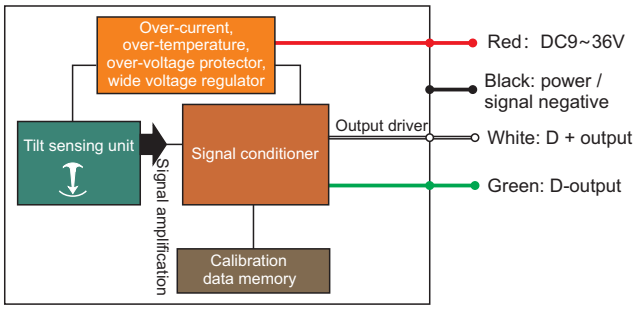
FEATURES

- Resolution 0.1°
- output method RS485(MODBUS)
- Wide voltage input9~36V
- IP67 Protection Class
- Output Surge Protection
- Wide temperature work-40℃ ~ +85℃
- Input Overvoltage And Overcurrent Protection

APPLICATION RANGE

- Solar photovoltaic tracking system
- Hospital bed
- Vertical monitoring
- Wind deviation monitoring
- Woodworking machinery
- Electric vehicle control
- Building tower crane

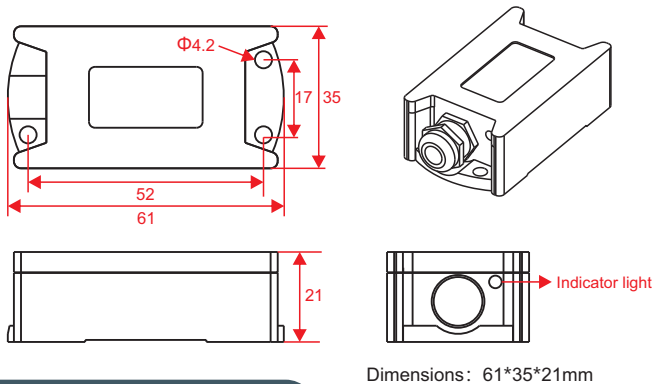
SYSTEM BLOCK DIAGRAM



SPECIFICATION PARAMETERS

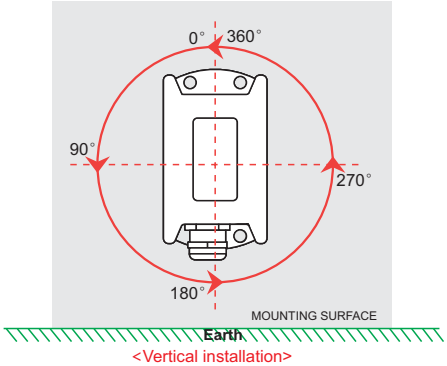
YCA360M	Parameter	unit
Range	0～360°	
Resolution	0.1	
Measurement Accuracy(RMS)	±0.3	°
Response Time	0.1	S
Temp. Drift Characteristics	±0.003	°/℃
Operating Temp.	-40~85℃	
Output Interface	Rs485 (RTU MODBUS protocol)	
Output Load	> 500 ohm	
Operating Hours	50000 hours / time (no failure)	
Insulation Resistance	>100Megohm	
Anti-vibration	10grms、10~1000Hz	
Impact Resistance	100g @ 11ms, triaxial and same (half sine wave)	
Weight	150g(Without cable)	
Certified Product	Appearance patent，CE，FCC，CCC	
Production standards	GB/T191SJ20873-2003 General specifications for inclinometers and spirit levels	
Quality System	ISO9001: 2015 Standard (Certification No.: 128101)	

DIMENSIONS



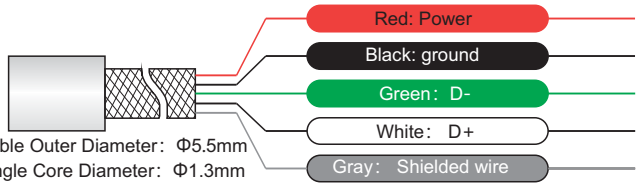
Dimensions：61*35*21mm

INSTALLATION MEASUREMENT



<Vertical installation>

DEFINITION OF WIRING



Cable Outer Diameter：Φ5.5mm
Single Core Diameter：Φ1.3mm

INSTRUCTIONS FOR USE

1. The Working Principle Is Sensing Gravity Of Earth, When Installation, The Sensing Axis Of The Sensor Should Be Parallel With The Tilt Axis Of Measured Object To Achieve The Best Accuracy. The Install Surface Of The Measured Object Must Be Flflat, Stable, Contact Close, Error May Be Caused If The Installation Surface Is Not Even.
2. The Protection Class Is Ip66, Rain Or Water Spray Would Not Affect Its Proper Work, Please Do Not Soak It Under Water For Long Time In Case Inner Circuit

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DPF PRODUCT DEBUGGING SOFTWARE

1. Communication protocol compatibility Modbus RTU protocol :
Default baudrate:9600bps,Check bit: None,Data bit: 8, stop bit: 1;

Register Asddres	Data Value Definition	Data Type	Select Value
0000H	X Axis Angle Value -high Position	Custom	Range
0001H	X Axis Angle Value-low Position	Custom	Range
0006H	Set /cancel Zero Setting	INT16U	5A5AH
0007H	Local Address	INT16U	0101H~FFFFH(Except 6868H)
0008H	Baudrate	INT16U	A0A0H~A2A2H

03h For Reading Register, 06h For Writing Register And 42h For Reading Local Address.

2. Set Sensor Address Command:

Address	Function Code	Register Address High Byte	Register Address Low Byte	Sensor Address(Target Value)	Sensor Address(Target Value)	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

Response

Address	Function Code	Register Address High Byte	Register Address Low Byte	Sensor Address(Target Value)	Sensor Address(Target Value)	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

E.g:Send Command : 01 06 00 07 05 05 CRC Low CRC High
Response Data : 01 06 00 07 05 05 CRC Low CRC High
This Command Sets The Address Of The Sensor To 0x05, And The Restart Takes Effect After Setting.
Note:1. After The Address Is Answered Successfully, It Will Take Effect After Restarting.
2. Address 0x68h Is The Factory Use Id, Which Cannot Be Used By The Customer.

3. Read Sensor Address Command:

Address	Function Code	Address Start High Byte	Address Start Low Byte	Address Number High Byte	Address Number Low Byte	CRC Check
0x00	0x42	1byte	1byte	1byte	1byte	2byte

Response

Address	Function Code	Return Data Byte Numbers	The Current Address	The Current Address	Crc Check
1 byte	0x42	1byte	1byte	1byte	1byte

E.g:Send Command : 00 42 00 07 00 01 CRC low CRC high
Response Data : 01 42 02 01 01 CRC low CRC high
This command sets the address of the returned sensor to 0x01.

4. Set Sensor Baud Rate Command:

Address	Function Code	Baud Rate Start Address High Byte	Baud Rate Start Address Low Byte	Baud Rate Code High Byte	Baud Rate Code Low Byte	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

Response

Address	Function Code	Baud Rate Start Address High Byte	Baud Rate Start Address Low Byte	Baud Rate Code High Byte	Baud Rate Code Low Byte	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

E.g:send command:01 06 00 08 A0 A0 CRC low CRC high
Response data:06 06 00 08 A0 A0 CRC low CRC high
This command sets the baud rate of the sensor to 4800bps, and the restart takes effect after setting.
Note:a.Baud rate setting is successful and takes effect after restart.
b. Baud rate supported:A0-4800, A1-9600, A2-19200。

5. Set /cancel Sensor Relative Zero Command:

Address	Function Code	Set /Cancel Relative Zero Start Address High Byte	Set /Cancel Relative Zero Start Address Low Byte	Set/Cancel Relative Zero Command Value High Byte	Set/Cancel Relative Zero Command Value Low Byte	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

Response

Address	Function Code	Set /Cancel Relative Zero Start Addresshigh Byte	Set /Cancel Relative Zero Start Address Low Byte	Set/Cancel Relative Zero Command Value High Byte	Set/Cancel Relative Zero Command Value Low Byte	CRC Check
1 byte	0x06	1byte	1byte	1byte	1byte	2byte

E.g:Send Command:01 06 00 06 5A 5A CRC Low CRC High
Response Data:01 06 00 06 5A 5A CRC Low CRC High

6. Read Angle Data Command:

Address	Function Code	Read Angle Data Start Address High Byte	Read Angle Data Start Address Low Byte	Read Angle Data NO. High Byte	Read Angle Data NO. Low Byte	CRC Check
1 byte	0x03	1byte	1byte	1byte	1byte	2byte

Response

Address	Function Code	Returns The Number Of Angular Data Bytes	Hundreds Of Angle Data	Ten Digit And Single Digit Of Angle Data	Tenth And Percentiles Of Angle Data	Reserved Decimal Places Of Angle Data	CRC Check
1 byte	0x03	1byte	1byte	1byte	1byte	1byte	2byte

E.g:Send Command : 01 03 00 00 00 02 C4 0B
Response Data : 01 03 04 01 23 3C 00 CRC Low CRC High
Return Angle is 135.60°（angle Value =[(1 * 100) + (2 * 16 + 3) + (3 * 16+12) / 100])